QUERI-DM
Quality Enhancement Research Initiative-Diabetes Mellitus

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Eye Screening and Surveillance for Patients with Type 2 Diabetes: How to Optimize Outcomes

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Diabetes mellitus is a leading cause of blindness in the United States. Early detection and treatment of eye disease is effective in preventing visual loss. For many years, the prevention of diabetes related visual loss centered on annual screening for everyone with diabetes. However, to optimize outcomes and the use of resources, eye screening and surveillance intervals should be structured to find new eye disease, and then follow these incident cases and deliver timely treatment without overburdening patients at low risk for eye disease.

Therefore, QUERI-DM investigators undertook two studies designed to inform best practices and quality improvement efforts in eye care for diabetic patients. The first study focused on optimal screening intervals for diabetic eye disease;[1] the second evaluated the frequency of and reasons for suboptimal timing of treatment to prevent blindness.[2]

In the first study, the investigators used NHANES III data to estimate the distribution of age and glycemic control in the US diabetic population over 40 years, then created a hypothetical population in which to examine the costs and effectiveness of screening intervals of every year, every other year, every third year, or every fifth year, in patients with different levels of risk for eye disease. The results showed that for most patients, annual screenings are not cost-effective, and, for patients with no known eye disease, screening every other year would be a better strategy. Ideally, screening recommendations should be tailored to the individual patient, based on age and the degree glycemic control. For example, patients with A1c values over 10% may need annual screenings, whereas others may need screening every 2 to 3 years, with the longest intervals being for patients with excellent glycemic control. Two recent large prospective longitudinal studies have supported these recommendations, finding that the incidence of vision-threatening retinopathy occurring within 3 years of a normal retinal examination is extremely low.[3,4]

The second QUERI-DM study reviewed medical records of patients who had retinal photocoagulation at one university and two VA hospitals to determine how frequently the procedure was suboptimally timed and for what reasons. Treatment was considered suboptimally timed if vision was impaired or threatened by retinal disease that earlier photocoagulation could have substantially decreased or delayed. Overall, 43% of cases were rated as probably or definitely suboptimally timed (47% at the university site; 40% at the VA sites). There were no cases of suboptimal timing in a patient who went 13-36 months between screening visits. One third of suboptimally timed cases were due to very poor screening, defined as no previous screening or a screening interval greater than 36 months. The remaining two thirds were due to surveillance problems (care of those with known retinopathy), such as failures to achieve close follow-up once retinopathy was detected, delays in scheduling treatment, or rapid progression and unanticipated pre-retinal or vitreous hemorrhage despite close surveillance.

Diabetic patients with good glycemic control may only need retinal screening every two to three years.

Patients with diagnosed eye disease need close follow-up, and treatment should be promptly scheduled.

The results of these 2 studies suggest that annual screening exams, often a measure of healthcare quality, may not be the most cost-effective way to prevent vision loss in patients with diabetes, and may in fact divert limited resources away from patients most at risk for preventable blindness. Tailoring screening intervals (for patients with *no eye disease*) to individual patients based upon the level of glycemic control would avoid overburdening low-risk patients, who could be screened every 2-3 years. Close surveillance (follow-up of patients *with known retinopathy)* and timely treatment is recommended for affected patients to prevent visual loss.

The VA Clinical Practice Guidelines for eye care in diabetes patients may be accessed on the Internet: http://www.oqp.med.va.gov/cpg/DM/DM3_cpg/content/ModE/modE_fr.htm

[1] Vijan S, Hofer TP, Hayward RA. Cost-utility analysis of screening intervals for diabetic retinopathy in patients with type 2 diabetes mellitus. JAMA. 2000;283:889-96.
[2] Hayward RA, Cowan Jr C, Giri V, Lawrence MG, Makki F. Causes of preventable visual loss in type 2 diabetes mellitus: an evaluation of suboptimally-timed retinal photocoagulation. Under review.
[3] Younis N, Broadbent DM, Vora JP, Harding SP. Incidence of sight-threatening retinopathy in patients with type 2 diabetes in the Liverpool Diabetic Eye Study: a cohort study. Lancet. 2003;361:195-200.
[4] Kohner EM, Stratton IM, Aldington SJ, Holman RR, Matthews DR. Relationship between the severity of retinopathy and progression to photocoagulation in patients with type 2 diabetes mellitus in the UKPDS. Diabet Med. 2001;18:178-84.

A Coordinated Proactive Diabetes Eye Care Program

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Background

Two previous QUERI-DM studies (see page 1), which found that current practices (annual eye exams regardless of risk or presence of eye disease) may waste resources and miss opportunities to significantly improve health outcomes, exemplify core features of the six-step QUERI Process Model (http://www.hsrd.research.va.gov/queri/program.cfm). These projects examined existing practice patterns, diagnosed quality gaps in care and identified evidence-based best practices to improve health outcomes and healthcare efficiency.

QUERI STEP 4: Implementing quality improvement projects based on evidence-based guidelines to address quality gaps and enhance health outcomes at the VA.

Building upon these findings, the Proactive Diabetes Eye Care Program was initiated to identify quality improvement strategies in eye care and to assess the feasibility of implementing such a program and its impact on patient and system outcomes. Using more targeted, risk-based criteria for scheduling eye examinations together with system level interventions designed to assure their application may lead to improved healthcare quality and outcomes throughout the VA.

Objectives

We will evaluate the impact of the Proactive Diabetes Eye Care Program, a coordinated and targeted system-level intervention, on:

1. The optimal timing of eye care visits
2. The optimal timing of photocoagulation
3. Patient & provider satisfaction
4. Health care resource use
5. The overall cost-effectiveness of using such a targeted eye care program.

Research plan

The primary intervention involves the use of an innovative "Progressive Reminder and Scheduling System" in which the timing and type of reminders are based on the patient's degree of risk for developing proliferative diabetic retinopathy or macular edema. Six facilities are currently involved in the project. The three intervention sites (Ann Arbor, Cleveland and Greater Los Angeles) will receive the scheduling intervention; the three control sites (Denver, Hines and Houston) will receive care as usual. This two-year project uses a quasi-experimental design with the control and intervention sites matched for comparability.

The intervention will be evaluated using historical controls (pre-post analyses) and by comparison to control sites.

Data collection

1. We will use VA automated data to determine resource use, patient demographics, co-morbidities and medications.
2. Trained medical personnel will conduct chart reviews on a random sample of patients undergoing photocoagulation to determine whether it was sub-optimally timed (i.e., the patient already had a major retinal hemorrhage or advanced macular edema at the time of the procedure).
3. A random sample of patients will be surveyed, at baseline and after 12 months, about non-VA eye care services they received and their attitudes toward and satisfaction with eye care.
4. We will survey health care providers regarding diabetic eye care services.

Impact

If successful, this program will serve as a model for implementing diabetes eye care best practices throughout the VA system, resulting in improved health outcomes for patients and a more judicious use of system resources. Additionally, this program could provide further information about the best approaches to managing other complex chronic diseases in which patients may benefit from treatment strategies based on risk stratification rather than according to a single standard.

WHAT IS QUERI-DM?

In 1998, VA's Health Services Research and Development Service launched the VA Quality Enhancement Research Initiative (QUERI). QUERI's mission is to translate research discoveries and innovations into better patient care and systems improvements in nine common conditions among veterans. QUERI-DM focuses on diabetes. Diabetes affects an estimated 16 million people in the United States – nearly 6% of the US population. In the VA population, the prevalence of diabetes is even higher – nearly 20%. For more information please refer to:

- Visit the QUERI website at: http://www.hsrd.research.va.gov/queri/
- Visit QUERI-DM's website at: http://www.va.gov/annarbor-hsrd/queri/queri_index.htm

Team Up for Diabetes Success

A Diabetes Quality Improvement Program

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As our population ages and the prevalence of obesity and the metabolic syndrome rise, we will see more and more veterans with diabetes and other chronic illnesses. In order to provide optimal care for these veterans, we must begin to shift our practice from the prevalent model of acute care to the chronic illness care model.

Background

In 2002, Partnerships for Quality Education provided funding to the New Mexico VA Health Care System (NMVAHCS) to develop and evaluate chronic illness care programs to manage diabetes. *Team Up for Diabetes Success* is a comprehensive program to improve resident physician education and patient care that was developed with this funding. The goals of this program are to use the chronic illness care model to enhance the quality of care for patients with diabetes and to foster a team of health care providers who are enthusiastic about diabetes care and confident that they can manage diabetes and other chronic illnesses.

Methods

The core curriculum for the resident education component of *Team Up for Diabetes Success* takes place during the ambulatory care rotation. The curriculum includes direct patient care, attendance at patient-centered diabetes education classes, observation and work with diabetes experts in individual and group clinics, web-based learning modules and discussion sessions, and the use of a diabetes registry to provide personalized feedback and population-based care. The patient care component of *Team Up for Diabetes Success* consists of improved access to care via the Team Up clinics, a pre-clinic screening program that reminds patients to come in for necessary screening tests prior to their visit with the primary care provider, and access to providers with improved clinical resources and decision support.

Results

Following the intervention, resident physicians in the intervention group had significantly higher diabetes-care self-efficacy scores compared to their pre-intervention scores and compared to residents in the control group. Residents in the intervention group had higher scores in the following categories of the Diabetes Attitudes Survey (DAS-3) compared to their pre-intervention scores and compared to residents in the control group: Need for Special Training, Seriousness of Type 2 Diabetes, and Value of Tight Control; and also had significantly higher Patient Autonomy scores compared to their pre-intervention scores. Patient self-efficacy and patient attitudes did not change during this study in either the control group or the intervention group. Clinical data are being analyzed.

Discussion

Although only a small portion of our data has been analyzed, we have found that a comprehensive diabetes education program for residents that uses many of the components of the chronic illness care model can improve provider self-efficacy and diabetes-care attitudes. We have yet to analyze our clinical data, but hope to find that participation in *Team Up for Diabetes Success* resulted in improved monitoring and management of diabetes-related risk factors and complications and improved glycemic control. Our ultimate goal for *Team Up for Diabetes Success* is to export it to our non-teaching clinics and to use it as a model for the development of other chronic illness care programs.

QUERI-DM GOALS

QUERI-DM's primary goal is to reduce preventable morbidity and mortality among veterans with diabetes. Within this goal, there are several specific focus areas:

1. Optimizing management of cardiovascular risk factors to prevent cardiovascular complications and mortality.
2. Decreasing rates of diabetes related complications, particularly vision loss, lower extremity ulcers and amputation.
3. Improving patient self-management.
4. Improving management of patients with diabetes and other chronic comorbid conditions.
5. Advancing clinically meaningful quality/performance measurement as an important tool for directly promoting quality improvement and for assessing the results of quality improvement interventions.

ADA-Approved Diabetes Programs

The following is a list of VA facilities with ADA-recognized diabetes education programs (as of April 2004). These programs meet the National Stands for Excellence in diabetes education. If your facility has an approved program and is not listed below, please contact Andrea Plaut, andrea.plaut@med.va.gov.

STATE	FACILITY
AR	Central Arkansas Veterans Healthcare System (Little Rock)
CT	VA Healthcare System/VA Connecticut (West Haven)
DE	Veterans Affairs Medical Center (Wilmington)
FL	North Florida/South Georgia Veterans Health System (Daytona)
FL	North Florida/South Georgia Veterans Health System (Gainesville)
FL	North Florida/South Georgia Veterans Health System (Jacksonville)
FL	North Florida/South Georgia Veterans Health System (Lake City)
FL	North Florida/South Georgia Veterans Health System (Ocala)
FL	James A. Haley Veterans' Hospital (Orlando)
FL	North Florida/South Georgia Veterans Health System (Tallahassee)
FL	James A. Haley Veterans' Hospital (Tampa)
IN	Department of Veterans Affairs (Crown Point)
MA	Edith Nourse Rogers Memorial Veterans Hospital (Bedford)
MA	Veterans Administration Boston Healthcare System (Boston)
MA	Veterans Administration Boston Healthcare System (Brockton)
MA	Department of Veterans Affairs Medical Center (Leeds)
MA	Veterans Administration Boston Healthcare System (West Roxbury)
MI	John D. Dingell VA Medical Center (Detroit)
NE	VA Nebraska-Western Iowa Health Care System (Grand Island)
NE	VA Nebraska-Western Iowa Health Care System (Lincoln)
NE	VA Nebraska-Western Iowa Health Care System (Omaha)
NH	VA Medical Center (Manchester)
NJ	VA New Jersey Health Care System (Lyons)
NM	New Mexico VA Health Care System (Albuquerque)
NY	Stratton VA Medical Center (Albany)
NY	VA Western New York Health Care System (Batavia)
NY	VA Western New York Health Care System (Buffalo)
NY	Department of Veterans Affairs Medical Center at Northport (Northport)
NY	VA Healthcare Network - Upstate New York at Syracuse (Syracuse)
NC	Durham VA Medical Center (Durhan)
OH	Louis Stokes Cleveland VA (Brecksville)
OH	Louis Stokes Cleveland VA (Cleveland)
OH	Department of Veterans Affairs Medical Center (Dayton)
PA	Department of Veterans Affairs Medical Center (Wilkes-Barre)
RI	Department of Veteran's Affairs Medical Center (Providence)
TN	VA Medical Center (Memphis)
TX	South Texas Veterans Health Care System (Audie L. Murphy Division, San Antonio)
TX	South Texas Veterans Health Care System (Frank Tejeda Outpatient Clinic, San Antonio)
VT	Department of Veterans Affairs Medical Center (White River Junction)
VA	Veterans Affairs Medical Center (Hampton)
VA	Hunter Holmes McGuire VA Medical Center (Richmond)
VA	Department of Veterans Affairs Medical Center (Roanoke)
WV	Louis A. Johnson VA Medical Center (Clarksburg)
WI	William S. Middleton Memorial Veterans Hospital (Madison)
WI	Zablocki Veterans Affairs Medical Center (Milwaukee)

Update the QUERI contact person at your facility

QUERI-DM maintains a contact list to establish a link between QUERI-DM and individuals who are actually providing care to patients. If you are involved in diabetes care at your facility and would like to join the list, please contact Andrea Plaut, 734-769-7100 x6257 or andrea.plaut@med.va.gov, or return the Contact Sheet enclosed in this newsletter by mail or by fax.